



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,419	06/20/2003	Hongxin Song	MP0275/13361-045001	6709

26200 7590 09/08/2011
FISH & RICHARDSON P.C.
P.O BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER

RIZK, SAMIR WADIE

ART UNIT	PAPER NUMBER
----------	--------------

2112

NOTIFICATION DATE	DELIVERY MODE
-------------------	---------------

09/08/2011

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary

Application No.

10/600,419

Applicant(s)

SONG ET AL.

Examiner

SAM RIZK

Art Unit

2112

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 1, 2, 4-6, 8-10, 12, 14-16, 18-20, 22-26, 29-41, 43-48, 51-54, 56-58, 60-68 and 71-82 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☒ The drawing(s) filed on 20 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

Continuation of Disposition of Claims: Claims pending in the application are 1,2,4-6,8-10,12,14-16,18-20,22-26,29-41,43-48,51-54,56-58,60-68 and 71-82.

Detailed Action

- Response to the applicant's RCE and amendment dated 5/31/2011
- Claims 3, 7, 11, 13, 17, 21, 27, 28, 42, 49, 50, 55, 59, 69 and 70 have been cancelled
- Claims 1, 2, 4-6, 8-10, 12, 14-16, 18-20, 22-26, 29-41, 43-48, 51-54, 56-58, 60-68 and 71-82 have been submitted for examination
- Claims 1, 2, 4-6, 8-10, 12, 14-16, 18-20, 22-26, 29-41, 43-48, 51-54, 56-58, 60-68 and 71-82 have been rejected

RCE

A request for continued examination under 37 CFR 1.114 was filed in this application after a decision by the Board of Patent Appeals and Interferences, but before the filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit or the commencement of a civil action. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 5/31/2011 has been entered.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

1. Claim 64 is rejected under 35 U.S.C. 101 because the claim invention is directed to non-statutory subject matter.

A computer-readable medium embodying information (i.e. software instruction(s)) is not tangibly embodied. A non-transitory computer-readable medium overcomes such rejection.
2. Dependent claims 65-68, 71 and 75 are also rejected due to their dependency on a rejected base claim.
3. Claim 72 is rejected for the same reasons as per claim 64.
4. Dependent claims 73 and 74 are also rejected due to their dependency on a rejected base claim.

Response to Arguments

5. Applicant's arguments with respect to the independent claims have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
 2. Ascertaining the differences between the prior art and the claims at issue.
 3. Resolving the level of ordinary skill in the pertinent art.
 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
6. Claims 1, 2, 4-6, 8-10, 12, 14-16, 18-20, 22-26, 29-41, 43-48, 51-54, 56-58, 60-68 and 71-82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rothberg as applied to claim 1 above, and further in view of Takashi et al. US patent no. 6519715 (Hereinafter Takashi)
7. In regard to claim 1, Rothberg/Takashi teaches:
- (Currently Amended) A signal processing apparatus comprising:
 - an input to receive a signal, wherein the signal from the input comprises an analog signal;
 - an analog-to-digital converter (ADC) to convert the analog signal to a digital signal;
(Col. 3, lines (45-50 in Rothberg)
 - a buffer responsive to the ADC to store the digital signal;
(Figure 2, ref. (10 in Rothberg)
 - a filter in communication with the ADC to produce a filtered digital signal based on the digital signal;
(Figure 1, ref (1) & (3) in Takashi)

- a detector responsive to the filter to interpret the filtered digital signal as discrete values;
(Figure 1, ref (7) in Takashi)
- an averaging circuit in communication with the buffer and the detector to cause interpretation, by the detector during a retry mode, of a new signal comprising an average that is determined responsive to a group of signals, the group of signals comprising one or more previous signals stored in the buffer and a current signal;
(FIG. 1B reference character (20) in Rothberg)
- a control circuit that determines whether the discrete values are adequately indicated based on output of the detector, that initiates the retry mode when the discrete values are not adequately indicated, and that determines whether the discrete values are adequately indicated from the interpretation of the new signal in the retry mode; and
(FIG. 1B, reference character (18) and FIG. 8, reference characters (68) and (72) and col. 5, lines (55-65)in Rothberg)
- an error correction circuit in communication with the detector and the averaging circuit to provide a signal quality metric that is based on output of the detector, wherein the control circuit uses the signal quality metric to include a signal of the group of signals in the average or exclude a signal of the group of signals from the average.
(FIG. 4 and col. 4, lines (27-58) in Rothberg)

It would have been obvious to one of ordinary skill in the art at the time

the invention was made to combine the teaching of Takashi that comprises a filter and an analog-to-digital converter (ADC) coupled between the input and the detector with the teaching of Rothberg. This modification would have been obvious to one of ordinary skill in the art, at the time the invention was made, because one of ordinary skill in the art would have recognized the need for improved reliability of the data recovery processing and data recording from storage medium.

8. In regard to claim 2, Rothberg teaches:

The apparatus of claim 1, wherein the signal from the input comprises a read signal received from a storage medium.

(Note: FIG. 1 B, reference character (10) in Rothberg)

9. In regard to claim 4, Takashi teaches:

- The apparatus of claim 3, wherein the buffer is coupled between the ADC and the filter.

(Note: FIG. 2, reference character (6) in Takashi)

10. In regard to claim 6, Takashi teaches:

- The apparatus of claim 3, wherein the filter comprises a finite impulse response (FIR) digital filter coupled between the ADC and the detector.

(Note: col. 8, line 42 in Takashi)

11. In regard to claim 8, Takashi teaches:
 - The apparatus of claim 1, wherein the detector comprises a Viterbi detector.(Note: FIG. 35, reference character (13) in Takashi)
12. Claims 9, 12, 19, 22, 30, 34, 43, 45, 52, 53, 61, 64 and 72 are rejected for the same reasons as per claim 1.
13. In regard to claim 10, Rothberg teaches:
 - The apparatus of claim 1, a wherein the control circuit causes averaging of a defined number of most recent input signals, wherein the defined number is greater than two.(Note: FIG. 2, reference characters (320 - 32n) in Rothberg)
14. Claims 20, 31, 62, 73, 76, 75 and 78 are rejected for the same reasons as per claim 10.
15. Claims 23, 35, 46, 54 and 65 are rejected for the same reasons as per claim 2.
16. In regard to claim 24, Rothberg teaches:
 - (Original) The method of claim 23, wherein sampling the input signal comprises converting the input signal to a digital signal, storing the sampled input signal comprises storing the digital signal, and the multiple signals to be averaged include the stored digital signal.(Figure 2, ref. (10) in Rothberg)
17. Claims 32, 33, 37, 44, 63, 66, 74 and 77 are rejected for the same reasons as per claim 24.

19. In regard to claim 26, Rothberg teaches:

The method of claim 22, wherein the input signal comprises a read signal received from a storage medium, interpreting the input signal comprises determining if the read signal adequately indicates the discrete values, and averaging the multiple signals comprises averaging multiple read signals of the storage medium to improve read signal interpretation.

(Note: FIG. 3 and col. 4, lines (13-26) in Rothberg)

20. Claims 43, 52, 61, 68 and 72 are rejected for the same reasons as per claim 26.

21. In regard to claim 38, Takashi teaches:

- (Original) The system of claim 34, wherein the means for reading further includes means for converting the read signals to digital signals, means for filtering the digital signals, and means for detecting stored information in the filtered digital signals.

(Figure 1, ref. (1), (3) & (4) in Takashi)

22. Claims 47 and 55 are rejected for the same reasons as per claim 38.

23. Claims 14, 36, 39, 56, 79 and 81 are rejected for the same reasons as per claim 4.

24. Claims 15, 40, 57, 80 and 82 are rejected for the same reasons as per claim 5.

25. Claims 16, 25, 48, 58 and 67 are rejected for the same reasons as per claim 6.

26. Claims 18, 27, 29, 41, 49, 51, 60, 69 and 71 are rejected for the same

reasons as per claim 8.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Rizk whose telephone number is (571) 272-8191. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott Baderman can be reached on (571) 272-3644. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronics Business Center (EBC) at 866-217-9197 (toll-free)

/Sam Rizk/

Primary Examiner, Art Unit 2112